

had left the hands of the author, for they are written in quite a different hand. The generic names are in one or two instances incorrectly written, and the numbers on the specimen pages are often very carelessly placed on the wrong end of the paper, so that the fish are seen on their back when the numbers are read; and they are frequently equally carelessly placed over the name of the specimen written by the hand of the author in pencil on each of the papers. Unfortunately these names, as well as being so written over in a few instances, have been obliterated by the dust and rubbing of the papers against the sides of the box; but the illustrations generally enable one to determine the specimens where the name has been so destroyed.

The specimens are prepared after the manner described by the uncle of the author, John Frederic Gronov, in a paper published in the 42nd volume of the 'Philosophical Transactions.' They are in a very good condition, showing that the plan is one well adapted for the purpose of a collection of the smaller species of fish.

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VII.—*A Catalogue of the Species of Ants found in Southern India.* By T. C. JERDON, Esq., Assistant Surgeon, Madras Medical Establishment\*.

I HAVE been induced to pen the following brief account of the Ants I have met with in Southern India, more with the view of stimulating others to record their observations on any species they may meet with, than under a sense of the value or completeness of the remarks contained herein. But no one, as yet, having taken the initiative, I trust that any errors in the accompanying paper will be pardoned by the scientific entomologist at home, and that the meagre details I have given will be improved and rendered more faithful and complete by observers in this country.

To assist any observers in this country, who may be able and willing to aid science on this subject, I shall here present them with a view of the classification of these interesting insects by modern entomologists, so that they may be able, in describing one which is deemed a novelty, to refer it to its place in the system, even if its real genus be not satisfactorily made out, which I fear will be too often the case, as I have experienced in my attempts at naming those described in the following pages.

Latreille, in the 'Règne Animal' of Cuvier, places Ants as part

\* Extracted from the 'Madras Journal of Literature and Science' for 1851, by Frederic Moore, Assistant, Museum, East India House.

of the family of the Heterogynes, of the section *Aculeata* of the order Hymenoptera, and divides them as follows:—

1st. *Formica*, without sting, the antennæ inserted near the forehead, and with triangular jaws; abdominal pedicle of only one knot or scale.

2nd. *Polyergus*, also without a sting, but with the antennæ inserted near the mouth, and the jaws narrow, arched or bent; abdominal pedicle also of one knot.

3rd. *Ponera*, neuters and females with a sting; abdominal pedicle of one knot; antennæ thicker towards the end; jaws triangular; head somewhat triangular.

4th. *Odontomachus*, differs from the last in the one abdominal pedicle ending superiorly in a spine; antennæ very slender and filiform in the neuters; head oblong, much notched posteriorly; jaws long, narrow, parallel, three-toothed.

5th. *Myrmica*, with sting; abdominal pedicle with two knots; jaws triangular; maxillary palpi long.

6th. *Atta*, differs from the last only in its short palpi; head of neuters usually very large.

7th. *Cryptocerus*, also with a sting; two knots in the abdominal pedicle; head very large and flattened, with a cleft on each side to lodge part of the antennæ. (Peculiar to South America.)

St. Fargeau, in the 1st volume on the Hymenoptera in the 'Suites à Buffon,' divides the Ants thus:—

1st Tribe. *Les Myrmicites*, females with a sting; 1st segment of abdomen of two knots. This includes the following genera: 1st, *Cryptocerus*; 2nd, *Atta*; 3rd, *Ocodoma*; differing from *Atta* in its larger head, and the presence of spines. 4th, *Myrmica*.

2nd Tribe. *Les Ponerites*, females with sting; 1st segment of abdomen of one knot only. It includes the genera *Odontomachus* and *Ponera*.

3rd Tribe. *Les Formicites*, females without a sting; 1st segment of the abdomen of one knot only. It contains the genera *Polyergus* and *Formica*.

It will be shortly seen that many of our ants cannot be well referred to any of these genera; but as it is probable that some new genera have been formed by recent writers, I shall in general content myself with referring most of my species to one or other of those here characterized.

Following the arrangement of St. Fargeau, we have first the tribe of *Myrmicites*, and the first genus mentioned by him, *Cryptocerus*, being American exclusively, we come to the genus *Atta* of Latreille, from which St. Fargeau has separated *Ocodoma*, the chief distinction being the spines which exist either on the head or thorax of the latter, which, moreover, is said to have the head

of variable size, whilst in *Atta* it is said to be usually not of a large size. We have in India species belonging apparently to both groups, which I shall now endeavour to describe.

### 1st Tribe. MYRMICITES.

#### Genus ATTA.

I possess six species of Ants, all of small size, which appear to belong to this genus, having a sting, two knots in the first segment of the abdomen, antennæ not concealed in a cleft, thorax without spines, and short palpi.

#### 1. *Atta minuta*, Jerdon (p. 105).

Worker barely  $\frac{1}{2}$ th of an inch long; head oblong; eyes minute, advanced; thorax narrow; abdominal pedicles long, narrow, the first much more raised than the second; antennæ gradually thickening, of a rufous colour, with the abdomen somewhat darker or fuscous. Female about  $\frac{1}{3}$ rd of an inch long, similar in form to the worker; abdomen larger proportionally, and head smaller.

This minute species makes a temporary nest in various situations—in an empty box; between the back of a book and its leaves; even among the loose pages of a book; in an empty shell, &c. Nothing is used in its construction, a shelter from the light merely being sought for. It is perhaps not very numerous in individuals; one wingless female is generally found in the nest. It is very common in the Carnatic and most of India, but I have not seen it in Malabar. It appears to prefer dead animal matter to saccharine or vegetable products.

#### 2. *Atta destructor*, Jerdon (p. 105).

Worker about  $\frac{5}{8}$ ths of an inch long; head oblong, not so long in proportion as in the last; eyes small, more medial than in the last; antennæ short; thorax narrow, slightly grooved; abdominal pedicles long, narrow, first higher than the second; abdomen oval; colour rufous; abdomen glossy brown. I have not seen the female.

They live in holes in the ground or in walls, &c., and are very numerous in individuals. They prefer animal to vegetable substances, destroying dead insects, bird skins, &c., but also feed greedily on sugar. They are very common in all parts of India, and often prove very troublesome and destructive to the naturalist.

#### 3. *Atta domicola*, Jerdon (p. 106).

Worker about  $\frac{1}{3}$ th of an inch long; head oblong; eyes moderate size, medial; antennæ rather long; jaws strongly 4-toothed;

thorax very slightly notched; abdominal pedicles narrow, first much raised, second slightly so; abdomen ovate; legs longish; head, thorax and legs deep red-brown; abdomen blackish.

This species of Ant does not seem to be common. I have only hitherto procured it at Nellore in a hole in a house, and I only saw one kind of individual.

† 4. *Atta rufa*, Jerdon (p. 106).

Worker  $\frac{1}{8}$ th to  $\frac{1}{3}$ th of an inch long; head short, oblong; eyes rather small, medial; antennæ rather short, with the two last joints much enlarged; jaws linear, oblong, strongly toothed; thorax slightly grooved; first abdominal pedicle lengthened, narrow in front, wide behind and much raised; second broader, not so high, of a uniform glossy rufous colour, with the end of the abdomen somewhat darker.

Warrior variable, about  $\frac{1}{4}$ th of an inch-long; head large, very square, slightly notched behind, smooth; eyes advanced, lateral; jaws oblong, quite entire, blunt; antennæ short, otherwise as in the ordinary worker. Female about  $\frac{7}{8}$ ths of an inch long; head small, diamond-shaped; eyes very large, three large ocelli on the top of the head; antennæ *not* geniculate, short, all the joints nearly equal; thorax thick in front, depressed behind; abdomen long, oval; wings reach beyond the abdomen.

This ant is the only one of the true *Atta* that has two kinds of neuter individuals, and in its form and general habits it approaches much to the next genus, *Ocodoma*; but as it wants the spines on the thorax, I have referred it to *Atta*. It is very common in Malabar, but is also found in the Carnatic; it is found in holes under ground, about gravel walks, mud walls, and often appears in houses, coming through a crevice in the floor or wall. There is a colony of them in my bathing-room, and every now and then vast numbers of the winged females (and males) issue forth just before sunset, attended as far as the window by swarms of the neuters of both kinds. Its favourite food is dead insects and other matter, but it also carries off seeds like the *Ocodoma*, as I know to my cost, chaff, &c. It stings very severely, leaving a burning pain that lasts for several minutes.

† 5. *Atta dissimilis*, Jerdon (p. 107).

About  $\frac{1}{10}$ th of an inch long; head oblong, rounded; eyes moderate; antennæ suddenly thickening at the last joint; thorax very slightly grooved; abdominal pedicles narrow above, both equally raised, first rather more conic than the second; abdomen long, oval, colour blackish throughout. I have only found this ant in small numbers on trees in Malabar.

6. *Atta floricola*, Jerdon (p. 107).

Worker not  $\frac{1}{17}$ th of an inch long; head oblong, square; eyes small, advanced; jaws linear, pointed; antennæ very short, last joint suddenly enlarged; thorax very slightly grooved; abdominal pedicles about equal, narrow, raised; abdomen long, oval; thorax and legs dark rufous; head and abdomen glossy dark brown.

I have obtained this very small ant, of which I have only seen one kind of individual, in small numbers on flowers and leaves at Tellicherry, and it appears to feed solely on vegetable secretions.

GENUS *OCODOMA*. (*Phidole*)

We now come to a set of Ants extremely numerous over all India, and comprising several species very nearly alike, and probably confounded together by those who have not examined them thoroughly. Almost all the species that I have seen have two kinds of neuters, one of them of very large size compared with the ordinary workers, and which are usually called warriors. Some points in the history of the œconomy of these Ants have caused much interest among naturalists at home with regard to the food of these little creatures. The chief distinction of *Ocodoma* from *Atta* consists in the former having some small spines on the thorax.

7. *Ocodoma malabarica*, Jerdon (p. 107).

Worker  $\frac{1}{8}$ th of an inch long; head oval; eyes moderate; jaws rounded, triangular, pointed and finely serrated; antennæ long and slender; thorax doubly notched and with some small tubercles, especially two in the usual situation of the thoracic spines; first abdominal pedicle small and conic, second large, rounded; head, thorax and legs rufous; abdomen blackish; legs long.

Warrior  $\frac{1}{4}$ th of an inch long; head enormous, rugose, striated, deeply notched behind; eyes minute, advanced, lateral; jaws triangular, bluntly toothed, and with an appendage at the base; thorax very rough, tubercled, with two minute rudimentary spines; first abdominal pedicle small, narrow, barely raised; second large, broad, raised, rounded; antennæ short; antennæ, legs and abdominal pedicles rufous, the rest of the body blackish.

This species of Ant appears to form a link between the two genera *Atta* and *Ocodoma*, as shown by the rudimentary state of the thoracic spines. I have found it chiefly about houses; it runs rapidly, lives both on insects and other animal matter, and on sugar, bread, &c. At first sight I mistook it for a small species of *Formica*, mentioned hereafter, *F. vagans*.

+ 8. *Ocodoma providens* (Sykes ?), Jerdon (p. 108).

Worker about  $\frac{1}{7}$ th of an inch long; head somewhat ovate, bulging slightly at the sides and narrowed behind, notched posteriorly and with two points, rough and granular; eyes moderate, central; thorax slightly grooved, with two small spines on its posterior angles; first abdominal pedicle pointed, second longer, broader and rounded. Warrior with jaws pointed and finely toothed; thorax very rough. Length  $\frac{1}{4}$ th of an inch; head large, otherwise similar.

I am by no means certain if this be Sykes's species or not, and indeed, without actual comparison, it would be very difficult to determine, so similar are the general features of these small ants, of which I possess four very closely allied species from Southern India, and have only collected these from two or three localities; so that many other allied species may still exist.

The habits and manners of all are very similar. They live under ground, making for their size a large series of excavations. Their common food I suspect to be animal matter, dead insects, &c., which at all events they take readily, but they also carry off large quantities of seeds of various kinds, especially the small grass seeds, and, as every gardener knows to his cost, more especially garden seeds. They will take off cabbage, celery, radish, carrot and tomato seeds, but are particularly partial to the light lettuce seeds; and in some gardens, unless the pots in which they are sown be suspended or otherwise protected, the whole of the seeds sown will be removed in one night. I have also had many packets of seeds (especially lettuce) in my room completely emptied before I was aware that the ants had discovered them. I do not know, however, if they eat them or feed their larvæ on them, though for what other purpose they carry them off I cannot divine. I have often observed them bring the seeds outside their holes, as recorded by Colonel Sykes, and this, I think, generally at the close of the rainy season; but in some cases I had reason to believe that it was merely the husks, of which I have seen quite heaps, and that the ants did not take them back to their nests. If any of the forementioned seeds be sown at once in a bed, most likely in the morning you will find the surface of the whole spot covered over with little ridges, the work of these creatures, and the few seeds that perhaps remain, dug all round, and being carried off, sometimes above ground, at other times under ground. Their galleries and subterranean passages are often very extensive, and it is no easy matter to dig down to their nest to see what becomes of the seeds. I have not procured the male or female of this species.

† 9. *Ocodoma diffusa*, Jerdon (p. 109).

Worker about  $\frac{1}{8}$ th of an inch long; head somewhat oval, nearly smooth, with a few scattered granules, slightly emarginate behind; eyes moderate size; thorax deeply grooved, with two small spines posteriorly; first abdominal pedicle very pointed, conic, second rounded, of equal height; head, thorax and legs rufous; abdomen brown.

Warrior  $\frac{1}{4}$ th of an inch long; jaw strongly toothed; head large, much striated, deeply notched behind; thorax more deeply grooved and tubercled; otherwise as in the worker. This species appears to be spread over most of India, and has similar habits to the last.

† 10. *Ocodoma diversa*, Jerdon (p. 109).

Worker about  $\frac{7}{8}$ ths of an inch long; head oblong, nearly smooth, emarginate behind; eyes small; jaws triangular, toothed; thorax but slightly grooved and with two longish spines posteriorly; first abdominal pedicle broadly conic, second rounded; head, thorax and legs dark maroon; abdomen blackish.

Warrior nearly  $\frac{1}{2}$  an inch long; head very large, nearly smooth, slightly striated; jaws lancet-shaped, entire; eyes small, somewhat advanced; antennæ short; otherwise as in the worker.

I procured this ant in the Wynaad, where it is not uncommon. The difference between the worker and the warrior is greater than in any other Indian species.

† 11. *Ocodoma affinis*, Jerdon (p. 110).

Worker  $\frac{1}{8}$ th of an inch long; head nearly square, almost smooth, with only a few striæ; eyes nearly medial, smallish; jaws triangular, with two strong teeth at the external angle of the jaw, and two smaller at the internal angle; thorax very slightly grooved, with two curved spines posteriorly; first abdominal pedicle very narrow, long, conic posteriorly, not much raised; second rounded, of equal height, broader; head, legs and thorax rufous; abdomen dusky.

Warrior nearly  $\frac{7}{16}$ ths of an inch long; head and jaws striated; eyes very minute; head notched anteriorly; antennæ inserted in a deep groove; metathorax elevated; no palpi apparently.

This ant is very common in Malabar; is nearly allied to, but differs from, *O. diversa* in the toothed jaws of the warrior, &c.

† 12. *Ocodoma minor*, Jerdon (p. 110).

Worker about  $\frac{5}{8}$ ths of an inch long, entirely rufous; head oblong, smooth; eyes small; jaws long, somewhat triangular, toothed, last tooth prolonged; thorax slightly grooved, with two small

spines in its posterior extremity; abdominal pedicles slightly raised, first long, conic, second rounded, both narrow above.

Female  $\frac{5}{8}$ ths of an inch long; head nearly square, slightly notched behind, three ocelli on top of head; eyes large, medial; head striated, with a hollow for the base of the antennæ; jaws triangular, bluntly toothed at the two angles; antennæ short; thorax much raised anteriorly, and with two small posterior spines; abdomen long, oval, large.

I, on one occasion only, found a single individual, which I presume to be the female (which had lost her wings), under a stone in my garden at Tellicherry, surrounded by numerous workers who were busy tending her, and removing some eggs or larvæ. It is the only female I have seen of this genus, and is well characterized by its large eyes and ocelli.

### † 13. *Ocodoma quadrispinosa*, Jerdon (p. 111).

Worker nearly  $\frac{1}{8}$ th of an inch long; head smooth; eyes small; thorax with two small spines anteriorly, and two large curved spines posteriorly; first abdominal pedicle long, raised, rounded behind; second also rounded, blunter, of equal height; head, legs and thorax dark rufous; abdomen blackish brown.

I have not seen the warrior (if any) of this race, which I found during the monsoon forming a small temporary mud abode round the head of flowers of a species of *Leucas* abundant in Malabar. It appeared to be feeding on the vegetable secretions surrounding the seeds.

Of these seven species of *Ocodoma* the first and last are very distinct from all the others, the first by having only rudimentary spines, and the last by having four spines instead of two. *Ocodoma minor* is easily recognized by its smaller size; and the other four are most readily distinguished by the jaws of the warriors, which in *diversa* is entire, in *affinis* with two teeth at each angle, in *diffusa* with moderately strong teeth throughout its extent, and in *providens* with the jaw very finely toothed.

### Genus ECITON. (*Pseudomyrma*)

The characters of this genus are thus given by St. Fargeau: "Antennæ entirely free, head elongated, and the thorax without spines; maxillary palpi long, of six joints; jaws linear; wings unknown." I have got four species of ants which perhaps may be ranged under this genus, of which only one species is described, and that from South America; but it is more than probable that they will form a new genus, to which however I will not attempt to impose a name. My species have a long slender body, oblong head, large eyes, short antennæ, inserted very near the mouth, linear or oblong jaws, and sting very severely.



✧ 14. *Eciton? rufonigrum*, Jerdon (p. 111).

Worker, length about  $\frac{1\frac{1}{4}}$ ths of an inch; head square; antennæ short, first joint thickened; very long palpi; eyes large, lateral, posterior; jaws somewhat linear, oblong, with two strong teeth at the external angle, and bluntly toothed in the rest of its extent; thorax slightly grooved; abdominal pedicles very little elevated, first very long; abdomen long, ovoid; thorax, legs, abdominal pedicles and antennæ rufous; head and abdomen black. This ant is very common in the Carnatic, less so in Malabar. It makes its nests in holes of trees, old palings, bamboo rafters, and such like; it does not care for sweets, is never seen on flowers, but devours dead animal matter. I have not seen the female. It stings very severely.

✧ 15. *Eciton nigrum*, Jerdon (p. 112).

Worker, length  $\frac{9}{24}$ ths of an inch; head long; eyes large, medial; antennæ short, the first joint not being so long as the head; jaws somewhat square, bluntly toothed; thorax low, barely grooved; both abdominal pedicles rounded, low; abdomen long, oval; sting very large. Colour uniform black. Female, length  $\frac{1\frac{1}{4}}$ ths of an inch; differs from the worker only in having wings. This ant, like the last, is rare in Malabar, but tolerably common in parts of the Carnatic; it has the same habits as the last, living in holes of trees, &c., and feeds on the same matter. I have found, on cutting open a dead branch on which they had formed their nest, many winged females, and larvæ and pupæ in different states of development.

16. *Eciton rufipes*, Jerdon (p. 112).

Worker, length  $\frac{1\frac{1}{8}}$ ths of an inch; head oblong; eyes very large, slightly advanced; thorax considerably grooved; abdominal pedicles long, low; abdomen long, ovate, black, with rufous legs.

I have only found this species on one occasion under a stone in the Salem district, and know not if it has the dendrophilous habits of the two last.

17. *Eciton minutum*, Jerdon (p. 112).

Worker about  $\frac{1}{6}$ th of an inch long, black throughout, very slender; legs rather thick; palpi much exposed. I regret that I have not at present a specimen of this little ant to describe from more fully. Its general structure, however, is exceedingly similar to that of its congeners, from which its small size sufficiently distinguishes it. I have found it both in the Carnatic and in Malabar, almost always on trees, but do not know if it

has its nest in holes of the wood or otherwise. Though scarce in individuals, it is by no means rare, and I hope to be able to describe it more fully hereafter.

#### GENUS MYRMICA.

*Gen. Char.* Antennæ sufficiently exposed; head triangular, without spines; maxillary palpi long, of six joints; jaws triangular; three cubital cells in the upper wings, the third incomplete, &c. Such are the characters assigned to this genus by modern authors. Whether the following species all belong to this genus or not, I cannot decide, but judging from their differences, I imagine that they form at least three groups.

In the first group I shall place two or three nearly allied species, one of which has already been described by Col. Sykes as a *Myrmica*, so that it may be considered the typical group. Of this I have what I imagine to be three species, but all very closely allied to each other.

#### 18. *Myrmica diffusa*, Jerdon (p. 113).

Worker rather more than  $\frac{1}{3}$ th of an inch long; head wider than thorax, oblong, triangular, striated; antennæ rather short, basal joint barely longer than the head, inserted near the mouth; eyes large; thorax notched, with two small spines on the posterior angles, curving backwards; first abdominal pedicle longish, somewhat heart-shaped, excavated, second obovate, both very slightly raised; abdomen triangular; head and body rufous; abdomen dark glossy brown.

Female, head not wider than the thorax, which is not spined; length  $\frac{5}{12}$ ths of an inch; wings not so long as abdomen.

Male, head very small; eyes large; antennæ with the first joint not elongated; no spines on thorax, which is much raised; wings reach beyond abdomen; length  $\frac{1}{7}$ th of an inch.

This is a well-known and widely diffused species, being found throughout India. It makes its nest in holes in branches of trees, runs with its abdomen turned upwards almost over its head, especially when excited, and feeds on honey and other vegetable secretions. Occasionally they appear to join their nest among the roots of moss, orchideæ, and various epiphytic plants; at least this is the case in Malabar, and I cannot detect any marked difference of species, although it is possible that the two races may be distinct. It is very pugnacious, and bites very severely, not appearing to use its sting much.

#### 19. *Myrmica rufa*, Jerdon (p. 114).

Worker, length  $\frac{9}{8}$ ths of an inch, head shorter proportionally, and eyes larger; thoracic spines longer, straighter; first abdo-

minial pedicle longer and less raised than in the last; entirely of a rufous colour.

This is a very closely allied species and is found in the same localities as the last. Had I found it in a different tract of country, I should have perhaps considered it as a climatal variety, but its large size and the few points enumerated above lead me to view it as distinct. Its habits are similar.

20. *Myrmica Kirbii*? (Sykes\*), Jerdon (p. 114).

Is very closely allied to the two last; has its thorax larger, rough, and much ridged; its thoracic spines larger; first abdominal pedicle somewhat diamond-shaped, second heart-shaped; the abdomen strongly ridged longitudinally; head, thorax and legs dark maroon; abdomen dark brown. Length  $\frac{7}{8}$ ths of an inch.

I have found this species chiefly in the elevated forests of the Wynaad; I cannot say that I have met it below the Ghauts. It forms a considerable nest of some papyraceous materials, usually of an oval form, and placed round a small branch which supports it. It is very numerous in individuals, countless swarms issuing from it on being disturbed, and boldly attacking the assailant both with teeth and sting. It feeds on honey of flowers and other vegetable secretions.

21. *Myrmica fodiens*, Jerdon (p. 115).

Worker, length  $\frac{4}{5}$ ths of an inch; head rounded, triangular striated; eyes large, posterior; jaws somewhat linear, four-toothed; thorax raised in front, depressed posteriorly, with two small spines on each side in front, and two tubercles above these, and two large nearly horizontal spines at the posterior extremity of thorax; first abdominal pedicle long, narrow, raised behind, second raised, rounded; abdomen somewhat triangular; head, thorax, legs and abdominal pedicles maroon colour; abdomen shining brown.

Female, head rather smaller proportionally, finely striated; eyes larger; three ocelli; jaws blunt, without teeth; antennæ scarcely longer than the head; thoracic spines less developed; abdomen larger.

This is one of the most common and abundant ants in Malabar; I do not remember to have seen it in the Carnatic. It seldom enters houses, but otherwise appears to take the place of *Formica indefessa*, which is not found in Malabar. It feeds chiefly on honey and other vegetable secretions, but also will

\* Trans. Ent. Soc. i. p. 99. Col. Sykes's specimens of *M. Kirbii* are in the Museum at the East India House.—F. M.

take dead animal matter. It is also occasionally found in the train of caterpillars feeding on leaves. It makes large excavations underground, generally having the entrance round the trunk of a tree, and it forms considerable heaps of fine earth round the mouth of the nest. It runs, unlike the last species, with its abdomen turned downwards under the abdominal pedicles. It appears to form the type of a very distinct group from the last.

22. *Myrmica? tarda*, Jerdon (p. 115).

Worker, length  $\frac{1}{6}$ th of an inch; head somewhat triangular, square behind, of same width as thorax; eyes rather small, quite lateral, somewhat posterior; antennæ short, thick, inserted near the mouth; thorax short, square, ending in two spines on each side, it and the head rough and shagreened; abdominal pedicles much raised, long, narrow; abdomen triangular, also shagreened; head, thorax, legs and abdominal pedicles brick-red; abdomen dusky, dark blue. This is a very curious-looking ant. It lives in holes in the ground in small societies, and feeds on vegetable secretions. It moves very slowly. It is found both in the Carnatic and Malabar.

23. *Myrmica? cæca*, Jerdon (p. 116).

Worker, length  $\frac{1}{2}$ th of an inch; head somewhat oval, rather small; no eyes; antennæ short, thick, inserted near the mouth; an oblique groove on each side of forehead for the insertion of the antennæ; jaws triangular, hooked at the tip, and finely serrated; thorax narrow, of uniform width, granulose, with an elevation posteriorly ending in two small spines; abdominal pedicles raised, rounded, pointed backwards, the first the highest; abdomen long, oval; head, thorax and legs reddish brown; abdomen glossy brown.

I found this curious ant only once, under a stone in the Wynaad.

[To be continued.]

### BIBLIOGRAPHICAL NOTICES.

*The Palm Trees of the Amazon and their Uses.* By A. R. WALLACE.  
With 48 Plates. London: Van Voorst, 1853.

WE beg most strongly to recommend this book, as one that will not interest the botanist alone, but give pleasure to unbotanical readers.

It must be looked upon as a highly valuable companion to the great work on Palms by Martius, supplying to us a very clear idea of the general appearance of the palm-trees. Being the work of a professed and excellent naturalist, it is quite trustworthy even in the